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WHAT IS CLAIMED IS:

1. An output queuing method for forwarding packets in a switch network, the switch network containing a plurality of port, each port corresponding to a port output queue, a global output queue shared by all port output queues, a FIFO (first in first out)

5 block allocated to each port output queue and to the global output queue, the FIFO block comprising Nb (a natural number) FIFO nodes and a pointer, each FIFO node comprising a first field and a second field, the output queuing method comprising:

receiving a packet and identifying the type and the destination port of the packet;

10 if the packet is a unicast packet, setting the first and second fields of a first FIFO node in the port output queue;

if the packet is a multicast packet, setting the second field of a second FIFO node in the global output queue according to the destination ports of the multicast packet, and setting the first field and the second field of a last one of the first FIFO
15 node in each port output queue;

reading the first field and the second field in the first FIFO node corresponding to the unicast packet and sending out the unicast packet; and

sending out or skipping the multicast packet according to the first field and the second field of the first FIFO node and the second field of the second FIFO node.

2. A method according to claim 1, wherein each FIFO node further comprises a third field, and the third field is 0 when the packet is a unicast packet and the third field is 1 when the packet is multicast packet.

3. A method according to claim 1, wherein the step of setting the first field
5 and the second field of the first FIFO node comprises:

incrementing the first field by 1 if the output queue is not one of the destination ports of the multicast packet and the second field is 0;

incrementing the second field by 1 if the output queue is not one of the destination ports of the multicast packet and the second field is not 0; and

10 incrementing the second field by 1 if the output queue is one of the destination ports of the multicast packet.

4. A method according to claim 1, wherein the step of reading the first field and the second field of the first FIFO node comprises:

reading the first field and the second field into a first register and a second
15 register.

5. A method according to claim 4, wherein the step of sending out or skipping the multicast packet comprises:

skipping m multicast packets from the global output queue wherein m (0 or a

natural number) is the value in the first register; and

sending out or skipping n (0 or a natural number) multicast packets from the global output queue wherein n is the value in the second register.

6. A method according to claim 5, wherein if the second field of the second
5 FIFO node directs that the port output queue is one of the destination ports of the multicast packet, one of the n multicast packets is sent out or skipped.

7. A method according to claim 6, wherein the step of sending out the multicast packet comprises:

releasing the second FIFO node if the second field of the second FIFO node
10 comprises only one bit of 1;

clearing one related bit if the second field of the second FIFO node comprises two or more bits of 1; and

releasing the FIFO block until all second FIFO nodes in the FIFO block are all released.

8. A method according to claim 1, wherein the step of sending out the unicast
15 packet comprises:

releasing the first FIFO node;

releasing the FIFO block until all first FIFO nodes in the FIFO block are all

released.

9. A method according to claim 1, wherein each port output queue comprises a first head pointer pointing to one of the first FIFO nodes in the port output queue.

10. A method according to claim 1, wherein each port output queue
5 comprises a first tail pointer pointing to one of the first FIFO nodes in the port output queue.

11. A method according to claim 1, wherein the global output queue
comprises a plurality of second head pointers and a second tail pointer, wherein each
second head pointer is one-to-one related to each port output queue and points to one
10 of the second FIFO nodes in the global output queue related to each port output queue;
and the second tail pointer points to one of the second FIFO nodes in the global output queue.

12. An output queuing method for forwarding packets in a switch network,
the switch network containing a plurality of port, each port corresponding to a port
15 output queue, a global output queue shared by all port output queues, the packets
being of the type of unicast or multicast, the output queuing method comprising:

detecting the type of a receiving packet;

if the type of the receiving packet is unicast, allocating the receiving packet into
the port output queue;

if the type of the receiving packet is multicast, allocating the receiving packet into the global output queue; and

determining to dequeue or skip the receiving packet in the global output queue according to the type of the receiving packet.